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Object Detection and Tracking in Real Time Environment With Different Colour Background in Euclidean Color Filter

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Abstract- *The innovation of moving item is imperative in numerous undertakings, for example, video reconnaissance and moving article following. In this paper, an audit has been made on a video reconnaissance situation with constant moving item identification and following. The configuration of a video observation framework is coordinated on programmed distinguishing proof of occasions of interest, particularly on following and arrangement of moving articles. The article following and discovery is utilized to set up a correspondence between items or article parts in continuous edges and to concentrate transient data about items, for example, direction, stance, speed and direction. Tracking is distinguishing the items outline by edge in video. It can be utilized as a part of numerous districts, for example, video reconnaissance, movement checking and individuals following. In static environment division of article is not complex. In element environment because of element ecological conditions, for example, brightening changes, shadows and waving tree limbs in the wind object division is a troublesome and noteworthy issue that should be taken care of well for a powerful visual observation framework. In this paper analysis of different colored object in different colored background with the help of Euclidean color filter and compare normal background with different lightening condition. In this work, we analysis the detection capability of filter in same color with different lightening condition background and find out the range of color detection by the filter.*

Index Terms— Color background, Euclidean Filter, Background Subtraction, Color Range.

Introduction

From many years the object tracking is a difficult task to perform in a complex environment, so that each algorithm has their own advantages and drawbacks. Any object tracking algorithm will contain errors which will ultimately cause a drift from the targeted object. The best algorithms should be used to decrease this drift such that the tracker is accurate over the time frame.

In object tracking the main challenge that has to think about while the operating a tracker are when the background is similar to interested object or another object which are present in the scene. This observable fact is known as clutter. Except Cluttering similar appearance itself in the frame is also a challenging task in the frame plane due to following factors.

A. VIDEO

Video is a source that joins an arrangement of casings to frame Video is a source that joins a course of action of housings to outline a moving picture or we can say video is a recording of moving visual pictures. There is less time interval between edges we can use various perception system to get the video, for instance, propelled camera, CCTV Camera, other electronic rigging. These all rigging is used for the adjacent view of article and for security reason. Further we remove the housings from the recordings for the bare essential examination of the substance in the progression of pictures. We differentiate each packaging and the successor diagram for the area and taking after of thing using unmistakable frameworks and strategies.

B. BACKGROUND SUBTRACTION

Establishment subtraction is a broadly used methodology for perceiving moving articles in recordings from static cameras. Establishment subtraction system is on a very basic level used for the frontal region acknowledged. Where the frontal zone is removed for the further get ready, for instance, commotion clearing, morphology at center...

C. COLOR-BASED CLASSIFICATION

In the packaging groupings, shading is for the most part predictable under viewpoint changes and it is definitely not hard to make. Though shading is not for the most part applicable as the individual strategy for perceiving and taking after things, yet for the figuring shading is an alluring segment for achievement when

suitable. To perceive and track human or whatever other thing dynamically shading histogram based methodology is used. Gaussian Mixture Model is made to portray the shading transport within the gathering of edges and to piece the housings into establishment and items.

1.1. SCALE INVARIANT FEATURE TRANSFORM (SIFT)

Scale-invariant feature transform (or SIFT) is an algorithm in computer vision to detect and describe local features in images. The algorithm was published by David Lowe in 1999. Applications include object recognition, robotic mapping and navigation, image stitching, 3D modeling, gesture recognition, video tracking, individual identification of wildlife and match moving.

SIFT features have many advantages such as follows:

- SIFT features are all natural features of images. They are favorably invariant to image translation, scaling, rotation, illumination, viewpoint, noise etc.
- Good specialty, rich in information, suitable for fast and exact matching in a mass of feature database.
- Fertility. Lots of SIFT features will be explored even if there are only a few objects.
- Relatively fast speed. The speed of SIFT even can satisfy real time process after the SIFT algorithm is optimized.
- Better expansibility. SIFT is very convenient to combine with other eigenvector, and generate much useful information.

1.2. THE MEAN SHIFT ALGORITHM

The Mean Shift figuring is a generous, non-parametric system that risings the slant of a probability course to find the mode (peak) of the apportionment (Fukunaga, 1990). Mean Shift was at first associated with the issue of mode searching for by Cheng (1995). Particle filtering considering shading movements and Mean Shift is delineated by Isard and Blake (1998) and connected by Nummiaro et al. (2002). Segment based article taking after (numbering flexible scale and establishment weighted histogram increases) is delineated by Comaniciu et al. (2003). CamShift is basically proposed to perform viable head and stand up to following in a perceptual customer interface (Bradski, 1998). It relies on upon a change of Mean Shift that, given a probability thickness picture, finds the mean (mode) of the scattering by stressing toward most great augmentation in probability thickness (Intel Corporation, 2001). The key qualification amidst CAMSHIFT and the Mean Shift computation is that CAMSHIFT uses interminably flexible probability allotments (that is, movements that may be recomputed for each packaging) while Mean Shift relies on upon static dispersals, which are not overhauled unless the target experiences basic changes perfectly healthy, gauge or shading.

1.3. EUCLIDEAN COLOR FILTER

A two-sided channel is a non-direct, edge-safeguarding and commotion diminishing smoothing channel for pictures. The power esteem at every pixel in a picture is supplanted by a weighted normal of force qualities from close-by pixels. This weight can be founded on a Gaussian appropriation. Essentially, the weights depend on Euclidean separation of pixels, as well as on the radiometric contrasts (e.g. range contrasts, for example, shading force, profundity separation, and so forth.). These jelly sharp edges by deliberately circling through every pixel and conforming weights to the adjoining pixels in like manner.

The reciprocal channel in its immediate structure can present a few sorts of picture curios:

Staircase impact - force levels that prompt pictures seeming like kid's shows

Gradient inversion - presentation of false edges in the picture

There exist a few augmentations to the channel that arrangement with these ancient rarities. Elective channels, similar to the guided channel, have likewise been proposed as a productive option without this impediment.

II. LITERATURE REVIEW

Bhavana C. Bendale et al. [1] modified to differentiate different class objects in real time video or this can be used to perform obstacle avoidance for robots or cars etc.

Sadaf Khan et al. [2] working on mean shift algorithm. Our emphasis will be on improvising the conventional mean shift algorithm with the application of LBP technique histogram for color feature extraction. Further modification will be applied to LBP and color histogram to make the object tracking more robust in comparison to the Simple RGB method along with the application for texture feature extraction and joint color histogram and further with correlation.

R. Zhang et al. [3] proposed taking after figuring in perspective of flexible establishment subtraction about the video recognizing and taking after moving things is presented in this paper. Firstly, center channel is used to perform the establishment photo of the video and denoise the course of action of video. By then adaptable establishment subtraction computation is used to recognize and track the moving articles. The reenactment results by MATLAB show that the adaptable establishment subtraction is profitable in both recognizing and taking after moving inquiries and establishment subtraction computation runs more quickly.

K.Srinivasan et al. [4] attempts to find subtracting in order to move articles the establishment pictures from static single camera video courses of action in security structures. It intends to improve the establishment

subtraction systems for indoor video observation applications. The novel modified cutoff updating (ATU) estimation is furthermore made and strove for various indoor video game plans which give better adequacy. The quantifiable and transient differencing techniques are similarly shown. Finally, novel technique is differentiated and the present frameworks.

Salvador et al. [5] grasped the c1 c2 c3 photometric invariant shading appears, and explored geometric segments of shadows.

Cucchiara's social affair et al. [6] used a momentary center isolating as a part of the RGB shading space to convey an establishment model.

Kaew Trakul Pong and Bowden et al. [7] changed shading pictures for establishment representation. In their system, each pixel in the scene is exhibited by a mix of Gaussian dispersals (and particular Gaussians are acknowledged to identify with different shades).

Elgammal et al. [8] used a nonparametric establishment model in perspective of piece based estimators that can be associated with both shading and grayscale pictures.

Koller et al. [9] used an adaptable establishment model considering monochromatic pictures filtered with Gaussian and Gaussian auxiliary (vertical a level) pieces for auto system.

Magee et al. [10] a vehicle tracking algorithm was presented based on the combination of a novel per-pixel background model and a set of foreground models of object size, position, velocity, and color distribution. The background model is based on the Gaussian mixture (GM).

Xiaowei An, Jaedo Kim and Youngjoon Han et al. [11] Mean shift utilizes color distribution with uniform quantization. But, the quantization method ignores the close relationship of color statistics. The color histogram consists of many empty bins because of uniform distribution. In order to reduce the number of empty bins an optimal color based means shift algorithm was proposed. In this the histogram agglomeration technique was applied to extract the optimal colors.

Liang Wei1 Xie, Xudong2 Wang, Jianhua, Zhang Yi4 Hu and jian ming et al. [12] In order to determine the candidate target region, mean shift algorithm was utilized and then a judgment on the tracking effect was made according to the Bhattacharyya coefficient. In case of tracking failure, the candidate area was matched with the target model by SIFT feature. In the next and final step a new track position was determined.

Hu Shuo, Wu Na and Song huajun et al. [13] Interest points are detected bu surf detector in reference region which is located in first frame manually. In the following the SURF features are extracted in a larger window which is selected as test region. In the matching stage we calculate the euclidean distance between descriptor vectors of interest points in the test image and ones in the reference image. The advantage of this approach is it implements real time tracking with robustness against appearance variations, scale change and cluttered regions.

III. PROPOSED ALGORITHM

It is more suitable to illuminate the whole structure with the help of a square diagram. The complete square diagram of the whole structure is showed up in Fig. 1.

High determination camera is joined with PC in the system, for instance, webcam. Camera sends pictures to the PC at the same time. At first Euclidean shading isolating of each photo is done. In this system the moving thing body shading is kept in picture and other shading is filtered. Subsequently the body shade of the moving thing is offered first to the structure. By then diminish scaling of the photo is done we change over the shading picture into dull, since it is definitely not hard to handle the faint picture in single shading instead of three tones. Dim pictures requires less time in taking care of. Finally settling of the photo is performed. From these isolating structures, shading picture ends up being totally high differentiation picture. In a matter of seconds position recognizable proof ends up being straightforward. The moving article is secured by shape and appeared in the PC. Along these lines taking after of moving article is done. The position at every minute is secured in PC memory for further get ready. Two neighboring edges concerning time are taken a gander at. By then the method for thing is determined. The method for article is appeared in the screen.

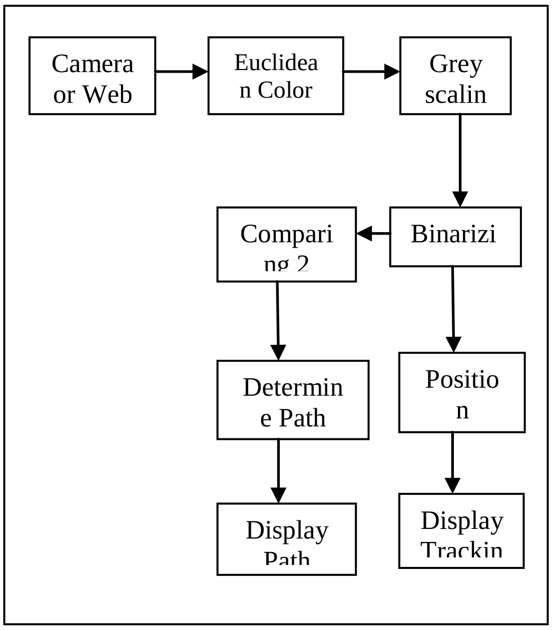


Figure 1: Operation process of filter

Shape taking after: Computer Vision toolset typically gives some structure examination instruments, which can be used to think frames from a twofold picture, to facilitate a structure against a format structure, etc. Structure examination can be valuable in reducing possible recognizable proof hopefuls when the target articles are direct shapes, for instance, rectangles, circles or ovals.

A thing in the wake of shading examination can be sent to shape isolating figuring. Shape examination relies on upon the parallel picture (cloak picture) yield of shading thresholding. Structure organizing estimations by and large take as information two shapes and yield a honest to goodness number exhibiting the degree to what they facilitate. An edge can be put on this number to markdown questions whose structures are too a long way from the required shape. Shape figuring don't use sliding window, as needs be is much faster than counts that are performed in a sliding window way.

A period arrangement of full length N is separated into various shorter time arrangement of length n = N, N/2, N/4… The normal rescaled reach is then ascertained for every estimation of n. For a (halfway) time arrangement of length n, X=X1, X2… Xn, the rescaled extent is computed as takes after:

The mean is computed from

$m = (1/n)\sum_{i=1}^{n} Xi$

Then a mean-adjusted series is created as represented in (2).

$Yt = Xt - m;\ t = 1,2,3, \ldots .\ n$

The cumulative deviate series Z is then calculated from (3).

$Zt = Yt\ ti{=}1\ t = 1,2, \ldots , n$

The range of R is computed from (4).

R (n) =max (Z_1,Z_2, … Z_n)-min (Z_1,Z_2, … Z_n)

The standard deviation S is computed from (5)

$$\mathbf{s(n)} = \frac{\mathbf{1}}{\mathbf{n}}\sqrt{\sum_{\mathbf{i=1}}^{\mathbf{n}}(\mathbf{Xi - m})\mathbf{2}}$$

The rescaled range R (n) / S (n) and average over all the partial time series of length n is calculated from (6).

$E\frac{R(n)}{s(n)} = C_n{}^{h}$

The standard test for turmoil is figuring of the biggest Lyapunov example. A positive biggest Lyapunov type demonstrates confusion. If there should be an occurrence of ongoing article following, we have managed three sorts of filters in our work.

IV. RESULTS AND ANALYSIS

As a result first have chosen many colors for the detection using different color background in real time environment and used 720 HD web camera of Dell for object detection.

A. FOR GREEN COLOR BACKGROUND

In figure 2 shows the green color detection on green color background but object detection is not possible due to same color, which is shown in 4th frame.

In figure 3 shows the blue color detection on green color background. In case blue color object is detected.

In figure 4 shows the orange color detection on green color background. In case blue color object is detected.

In figure 5 shows the red color detection on green color background. In case blue color object is detected

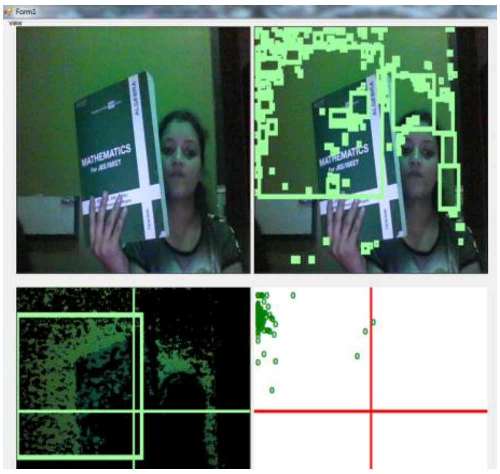


Figure 2: Green color object detection in green color background

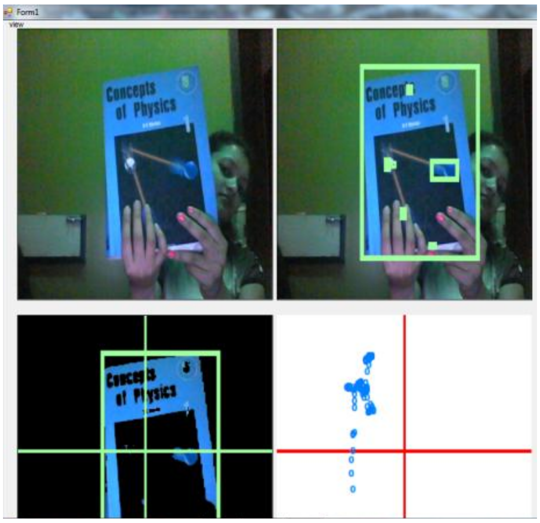


Figure 3: Blue color object detection in green color background

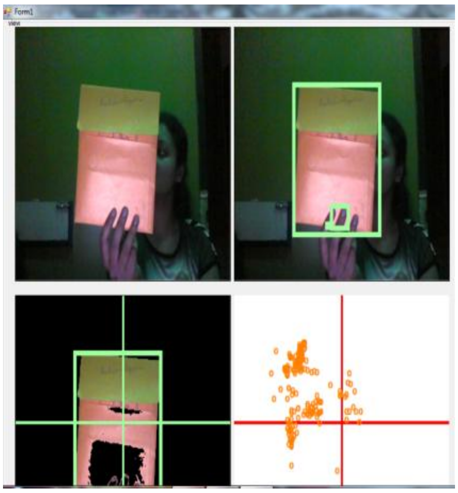


Figure 4: Orange color object detection in green color background

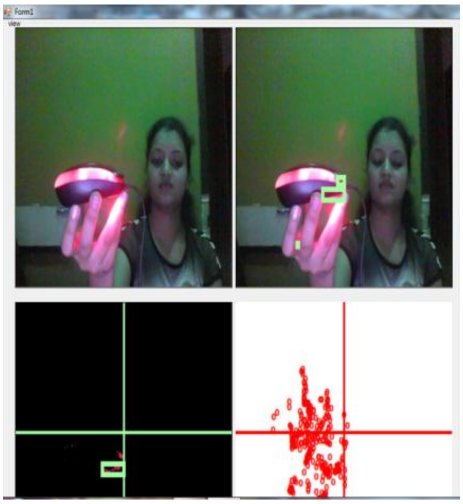


Figure 5: Red color object detection in green color background

B. FOR RED COLOR BACKGROUND

In figure 6 shows the red color detection on red color background but object detection is not possible due to same color, which is shown in 4th frame.

In figure 7 shows the green color detection on red color background. In case green color object is detected.

In figure 8 shows the orange color detection on red color background. In case orange color object is detected.

In figure 9 shows the blue color detection on red color background. In case blue color object is detected.

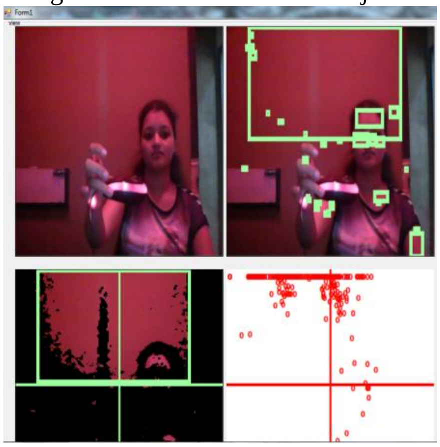


Figure 6: Red color object detection in red color background

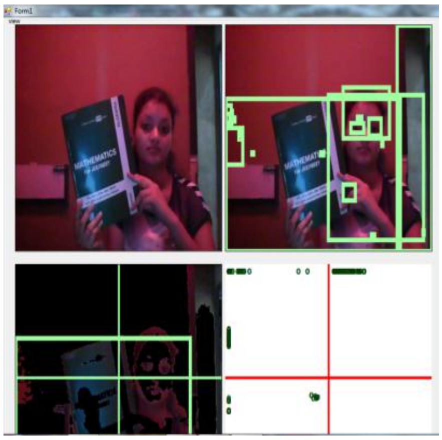


Figure 7: Green color object detection in red color background

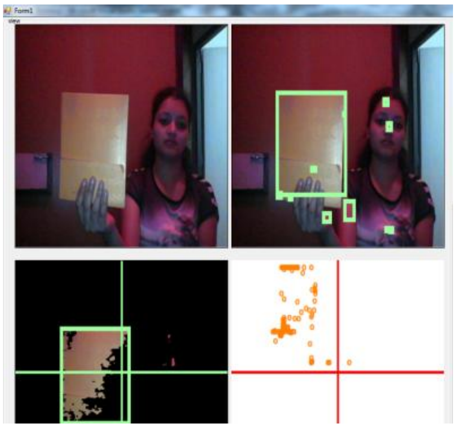


Figure 8: Orange color object detection in red color background

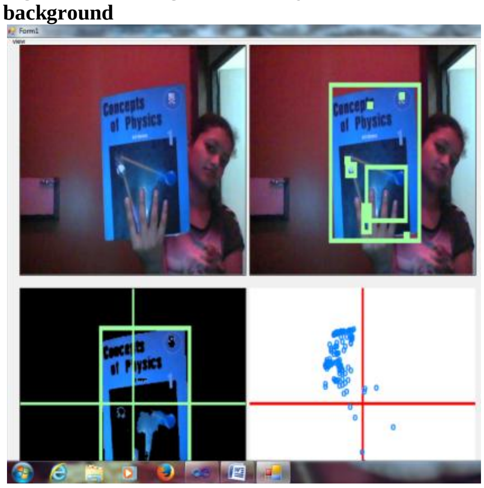


Figure 9: Blue color object detection in red color background

C. FOR BLUECOLOR BACKGROUND

In figure 10 shows the blue color detection on blue color background but object detection is not possible due to same color, which is shown in 4th frame.
In figure 11 shows the green color detection on blue color background. In case green color object is detected.
In figure 12 shows the red color detection on blue color background. In case red color object is detected.
In figure 13 shows the orange color detection on blue color background. In case orange color object is detected.

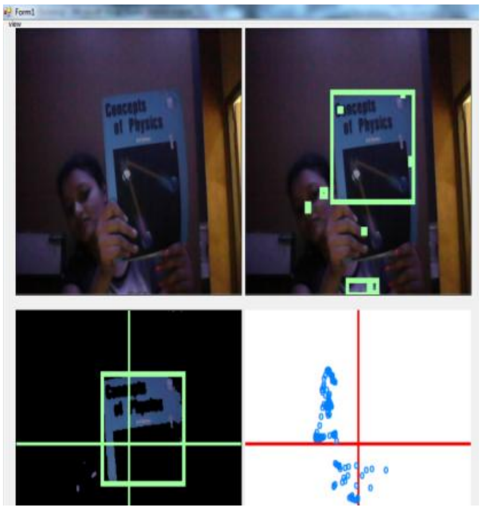


Figure 10: Blue color object detection in blue color background

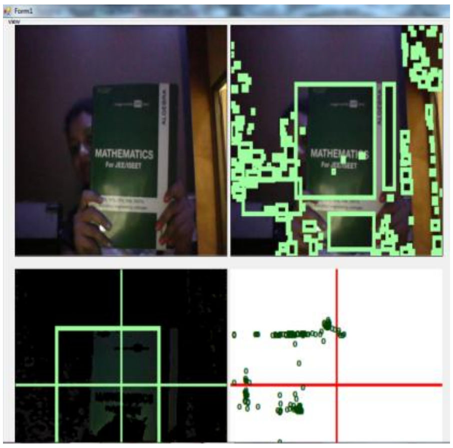


Figure 11: Green color object detection in blue color background

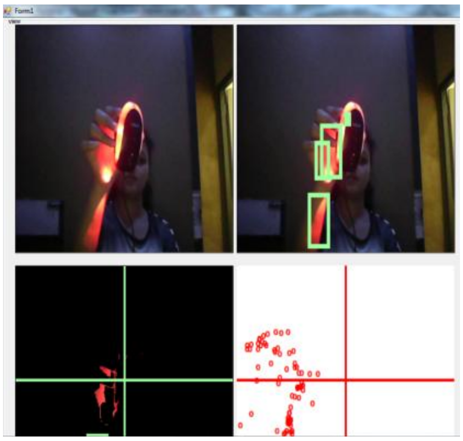


Figure 12: Red color object detection in blue color background

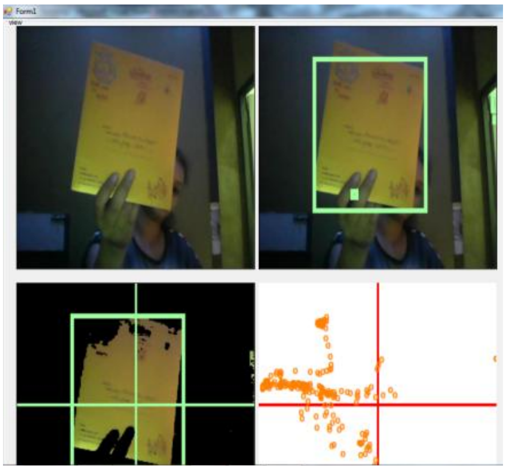


Figure 13: Orange color object detection in blue color background

D. FOR NORMALCOLOR BACKGROUND

In figure 14 shows the red color detection on normal color background. In case green color object is detected.

In figure 15 shows the green color detection on normal color background. In case green color object is detected.

In figure 16 shows the red color detection on normal color background. In case red color object is detected.

In figure 17 shows the orange color detection on normal color background. In case orange color object is detected

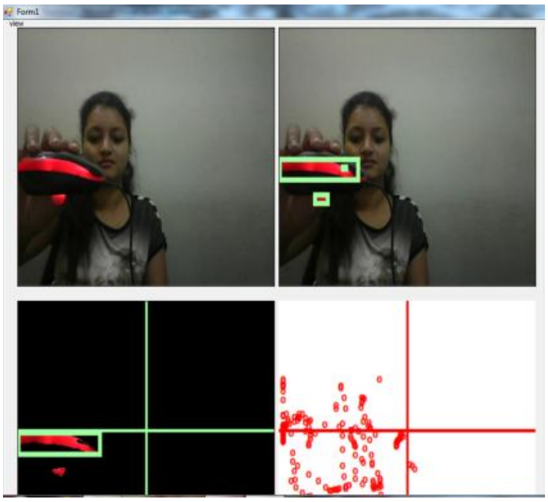


Figure 14: Red color object detection in normal color background

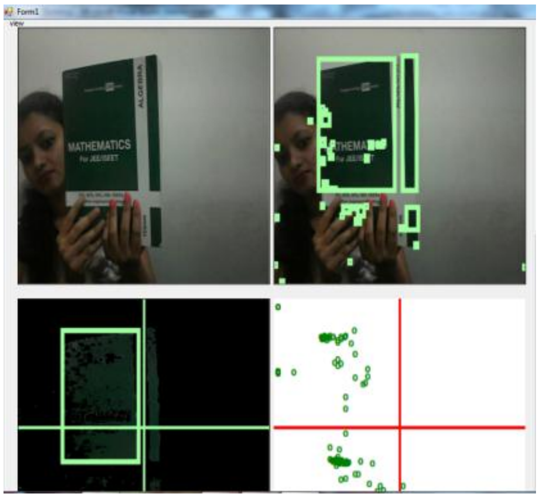


Figure 15: Green color object detection in normal color background

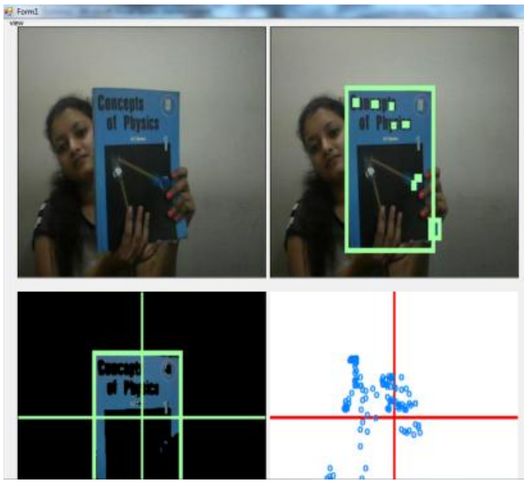


Figure 16: Blue color object detection in normal color background

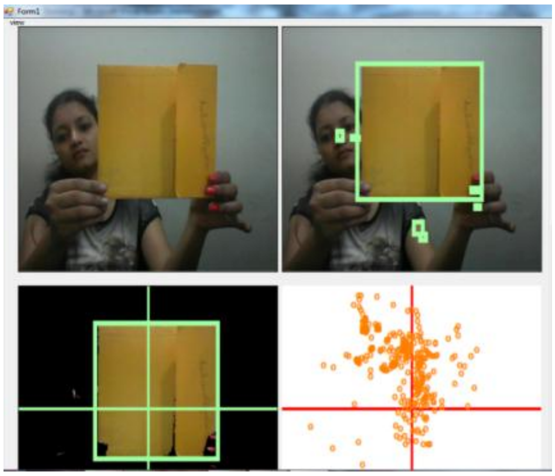
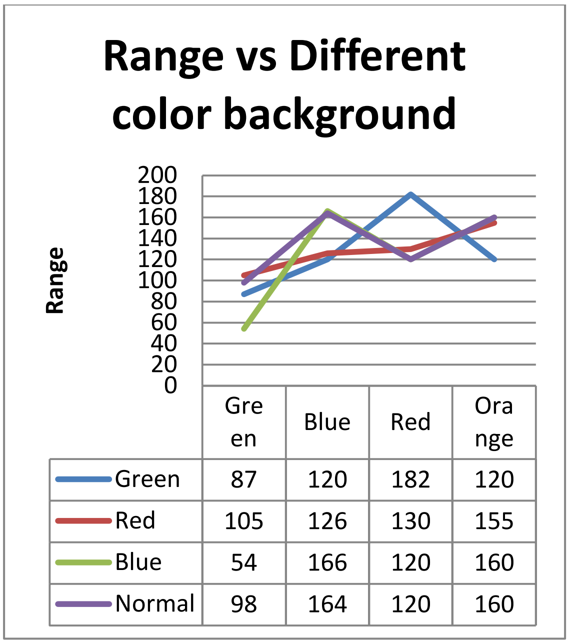


Figure 17: Orange color object detection in normal color background



	Green	Blue	Red	Orange
Green	87	120	182	120
Red	105	126	130	155
Blue	54	166	120	160
Normal	98	164	120	160

Figure 18: Graphical Representation of different between all colored background and color range

V. CONCLUSION

Figure 2-5 shows different color detection in green color background, results shows only green color object couldn't easily detect in this background and rest of color can easily detect by color filter.

Figure 6-9 shows the different color objects detection in red color background, results shows same manner as green color. Red color object couldn't easily detectable on this background by color filter.

Figure 10-13 shows the same color object detection in blue color background, results shows the same output. In this case only blue color couldn't easily detectable by filter

Figure 14-17 shows same color object in normal background, results show the all color easily detectable in background.

In Comparison graph (figure 18) we show the variation on range of color which are detect by filter. Above results shows that same color background couldn't subtract the same color object on this filter but other color either than background are easily subtract by background and detectable on screen. In case of normal background (White Color) all color objects can easily subtract and detect in particular range.

Range of the other colored background also are differ as compare to normal because of same color.

In future, detection on different colored background, in future can change the filter or range or algorithm to subtract and detect same color object on same color background easily.

REFERENCES

[1]. Bhavana C. Bendale and Prof. Anil R. Karwankar, "MOVING OBJECT TRACKING IN VIDEO USING MATLAB", International Journal of Electronics, Communication & Soft Computing Science and Engineering ISSN: 2277 – 9477, Volume 2, Issue 1,2014

[2]. Miss sadaf khan, Dr. Sanjay L. Haridas and Sanjay. B. Tembhurne, "REAL TIME OBJECT TRACKING USING MEAN SHIFT ALGORITHM -A REVIEW", ISSN 2348–9928, IJAICT Volume 1, Issue 7,November 2014

[3]. Li Zhang, Yuan Li and Ramakant Nevatia, "GLOBAL DATA ASSOCIATION FOR MULTI-OBJECT TRACKING USING NETWORK FLOWS", University of Southern California Institute of Robotics and Intelligent Systems, IEEE, 2008

[4]. K. Srinivasan & Dr. P. Balamurugan, "MOVING OBJECT TRACKING USING COLOR FEATURE IN A VIDEO", Global Journal of Computer Science and Technology Graphics & Vision, Volume 15, Issue 4,Version 1.0, Year 2015

[5]. Nicole M. Artner Salvador B. Ĺopez Marmol Csaba Beleznai and Walter G. Kropatsch, "KERNEL BASED TRACKING USING SPATIAL STRUCTURE", Article published on Austrian Research Centers GmbH - ARC, Smart Systems Division, Vienna, Austria

[6]. R. Cucchiara, C. Grana, M. Piccardi and A. Prati, "DETECTING OBJECTS, SHADOWS AND GHOSTS IN VIDEO STREAMS BY EXPLOITING COLOR AND MOTION INFORMATION", IEEE, 2002

[7]. P. Kaew TraKul Pong and R. Bowden, "AN IMPROVED ADAPTIVE BACKGROUND MIXTURE MODEL FOR REAL- TIME TRACKING WITH SHADOW DETECTION", In Proc. 2nd European Workshop on Advanced Video Based Surveillance Systems, AVBS01. Sept 2001. Video Based Surveillance Systems: Computer Vision and Distributed Processing, Kluwer Academic Publishers.

[8]. Ahmed Elgammal and Babak Saleh, "QUANTIFYING CREATIVITY IN ART NETWORKS", the 6th International Conference on Computational Creativity (ICCC'15), 2015

[9]. D. Koller, K. Daniilidis and H.-H. Nage, "MODEL-BASED OBJECT TRACKING IN MONOCULAR IMAGE SEQUENCES OF ROAD TRAFFIC SCENES" Similar Version Published In International Journal Of Computer Vision 10:3 (1993) 257–281.

[10]. Magee D., Treanor D., Crellin D., Shires M., Smith K., Mohee K., and Quirke P., "COLOUR NORMALISATION IN DIGITAL HISTOPATHOLOGY" Images Proc. Optical Tissue Image analysis in Microscopy Histopathology and Endoscopy (MICCAI Workshop) , pp100-111, 2009

[11]. Xiaowei An, Jaedo Kim, Youngjoon HanDepartment of Electronic Engineering, Soongsil University, Seoul, Korea, "Optimal

color-based mean shift algorithm for tracking objects", IET Computer Vision, Vol. 8, Iss. 3, pp.235-244, 2014

[12]. LiangWei, Xie, XudongWang, Jianhua,Zhangi, Hu,jianming "A SIFT BASED MEAN SHIFT ALGORITHM FOR MOVING VEHICLE TRACKING", IEEE Intelligent Vehicles Symposium (IV) pp 762-767 Dearborn, Michigan, USA June 8-11, 2014.

[13]. Hu Shuo, Wu Na, Song huajun, "OBJECT TRACKING METHOD BASED ON SURF",AASRI conference on modelling, Identification and control, 2012

[14]. http://www.ijetae.com/files/Volume5Issue6/IJETAE_0615_15.pdf